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ECONOMIC AND DEMOGRAPHIC SECURITY

EVALUATING AND MEASURING THE SECURITY OF RUSSIA'S BORDER REGIONS: THEORY AND PRACTICE

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The economic security of Russia's regions has been the focus of numerous studies. Significant contributions have been made to relevant methodological approaches and measurement tools. However, economic security has been little studied in the context of border regions. In this article, we address the methodological problems of employing existing methods and models for measuring the economic security of border regions. We pay special attention to the development of an evaluation algorithm incorporating the border regions' characteristics, the identification of groups (classes), a set of universal, specific, and special indicators as well as the impact of protective measures on economic security. To justify our proposals, we analyse the economic security of the Kaliningrad region; it is a study based on an evaluation of protective measures in the regional agricultural industry and of the effect of different factors on the generation of value added in the sector. We emphasise the need to take into account regional conditions when assessing economic security and to introduce economic and mathematical calculations into the relevant measurement algorithm at its different stages. We use our findings in providing a rationale for the central principles and procedures for creating a comprehensive model of the economic security of Russia's western border regions.

Keywords: economic security, border region, types, measures, evaluation methods, sectoral model, Kaliningrad region

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Introduction

The problems of measuring and evaluating regional economic security have been addressed in many works by Russian and international authors. Researchers pay special attention to terminology, threats, techniques, and algorithms for evaluating regional economic security, to indicators and their threshold values, and to management mechanisms and tools to enhance regional economic security [1, p. 5]. Despite the rapid development of the theory and practice of regional economic security, many methodological problems remain unsolved. In particular, there is no universally accepted list of regional indicators. The problems of justifying and forecasting the threshold values of such indicators remain poorly studied. Moreover, there is a need for a deeper insight into the effects of exceeding the threshold values. Thus, it is difficult to identify the state of a regional system and, according to [2], to establish the boundaries of its critical state that would hinder the normal development of the economy and social sphere. Note that critical states translate into the destructive tendencies in production and standards of living. Moreover, there are very few studies on the specifics of border regions.

The relevance of studying the evaluations of the economic security of Russia's border regions determined the aims and objectives of this research. We set out to assess the applicability of the existing theoretical and methodological approaches to the examination of border regions' economic security when developing a methodological framework for the use of such approaches. We considered the specifics of border regions, in particular, their economic performance, the quality of and risks associated with the environment, their influence at the national level, and the consequences of different threats and shocks, as against the other regions of Russia.

The novelty of the study lies in that we define the content and essence of the concept of economic security and its evaluation in the context of border regions. Moreover, we develop an assessment algorithm that will ensure the compliance with the situation identification requirements, contribute to the forecasting of the degree of region's 'safety', and help to assess the consequences of measures taken to overcome weaknesses.

Following the logic of the study, in this article, we consider consecutively the theoretical and practical problems of assessing the economic security of Russian regions, as well as the application methods and models for measuring economic security when analysing border regions. We present an algorithm for assessing and evaluating the economic security of border regions. In order to identify and evaluate the effect of protective measures on the level of economic security, we justify the application of

certain economico-mathematical models. We illustrate our findings with a value added simulation for the Kaliningrad region's agricultural industry. The simulation is based on the sectoral models that we developed in the framework of a project aimed to create data analysis software for regional studies. The project was supervised by Dr. Kseniya Voloshenko [3].

The theoretical framework for a methodology for diagnosing and evaluating regional economic security

A significant contribution to the studies into the problems of Russia's economic security and the development of a methodology for assessing regional economic security was made by researchers from the Institute of Economics of the Russian Academy of Sciences (Moscow) under the supervision of V.K. Senchagov [2; 4—7]. Equally important input was provided by research teams from the Institute of Economics of the Ural Branch of the Russian Academy of Sciences (Yekaterinburg), led by A.I. Tatarkin and A.A. Kuklina [8—11]; from the Institute of Economics and Industrial Engineering of the Siberian Branch of the RAS (Novosibirsk), led by S.V. Kazantsev [12—14]; and from the R.E. Alekseev State Technical University of Nizhny Novgorod (Nizhny Novgorod), led by S.N. Mityakov [2; 15; 16].[1] The Omsk Research Centre of the Siberian Branch of the RAS and the Omsk Regional Laboratory for Economic Studies of the Institute of Economics and Industrial Engineering of the Siberian Branch of the RAS also carry out research in the field, under the supervision of V.V. Karpov [1; 17].

The approaches to evaluating and diagnosing regional economic security have been classified in the works of V.K. Senchagov, Yu. M. Maksimov, S.N. Mityakov, and O.I. Mityakova [2; 6]; A.V. Konstantinov, E.A. Kolesnichenko, I.N. Yakunina, I.D. Motin [18]; A.A. Korableva, and V.V. Karpov [1]; Tambovtsev V.L. [19]; A.I. Tatarkin and A.A. Kuklin [10]; M.I. Krotov and V.I. Muntiyan [20], and others.

In the international literature, as T. D. Romashchenko stresses [21], economic security is studied within two independent disciplines — catastrophe theory (C. Zeeman, T. Oliva, E. Laszlo) and theory of risk (R. Dembo, R. Ceske, J. Clark, K. Arrow). Among the most prominent Western researchers focusing on the problems of economic security are R. Godland and H. Daly [22], V. Cable [23], A. Posen and D. K. Tarullo [24], Sheila R. Ronis [25], p. J. DeSouza [26, 27], Joseph J. Romm [28], A.H. Westing [29], Craufurd D.W. Goodwin [30], H. Nesadurai [31],

[1] Since 2010, the R.E. Alekseev State Technical University of Nizhny Novgorod has been closely collaborating with the Institute of Economics of the Russian Academy of Sciences. A laboratory for the regional problems of economic security was created and the 'Economic Security of Russia: Problems and Prospects' annual international conference established.

D.K. Nanto [32], Miles Kahler [33], G. Geeraerts and H. Weiping [34], M. Li [35], C. Lee [36], Jiang Yong [37]. In considering the phenomenon of economic security in the context of national security, they employ such categories as sustainability, efficiency, and globalisation.

Traditionally, Western researchers associated the term 'security' with protection from external threats (see, for example, [20; 25; 38]), as something that requires action from armed forces and intelligence services [39, p. 93]. However, later, 'security' studies incorporated a pronounced economic component. In particular, internal security factors are studied in the context of globalisation and international relations, [31; 33] and industry security in the context of industrial economics [35]. Moreover, the concept of 'economic security' is converging with that of 'sustainability'. In a number of works, there have been attempts to develop a system of measures that would take into account all the functional components of economic security. Here, one must mention R.M. Ashimov, A.S. Vasilyev, N.S. Vashchekin, A.V. Vorotyntsev, A.L. Gendon, G.A. Gershanokm N.S. Komendantova-Amann, I.I. Kokhanovskaya, Zh. A. Mingaleva, V.V. Mishchenko, A.A. Polyakov, A.L. Romanovich, A.D. Ursul, and O.N. Yutyaev.

This work is an attempt to adapt current theoretical and methodological findings to the conditions of a border region. This relates to the basic concepts, the evaluation of individual elements of economic security, the creation of an economic security system at the level of a border region, and the methodology for assessing and evaluating the phenomenon. In particular, based on an analysis of the existing approaches to regional economic security, we identify its semantic content as applied to a border region. This makes it possible to justify the key criteria for assessing and evaluating the economic security of border regions and to develop an assessment algorithm when considering the applicability of the current methodological approaches. Such an algorithm takes into account 1) the typological distinctions of regions, including border ones; 2) the identification of groups (classes) of threats to certain types of regions; 3) general, specific, and special indicators corresponding to performance assessment and the effect of border position factors. In building on the achievements and major findings of earlier studies, we contribute to the development of a theoretical and methodological framework for economic security studies in the context of border regions.

A rationale for applying current models and techniques to the evaluation of the economic security of border regions

A considerable number of original approaches to assessing regional economic security have been proposed so far. The range of tools is constantly growing. However, only a small group of techniques, most of which are based on measuring the dynamics of macroeconomic indicators, ranking, indices, and expert reviews, has found wide currency. Eco-

nomic and mathematical techniques and models are used much more rarely. A number of works analyses the methods for, and approaches to, assessing regional economic security [see, for example, 1; 2; 6; 9; 40; 41]. Based on our earlier conclusions, we systematise the existing approaches and offer an overview of models and techniques as applied to assess the economic security of border regions. The criteria for assessing the applicability of the existing approaches are identified based on the largely accepted theoretical concepts of economic security and respective approaches to defining the scope of the category of economic security [1; 6; 42] — fig. 1.

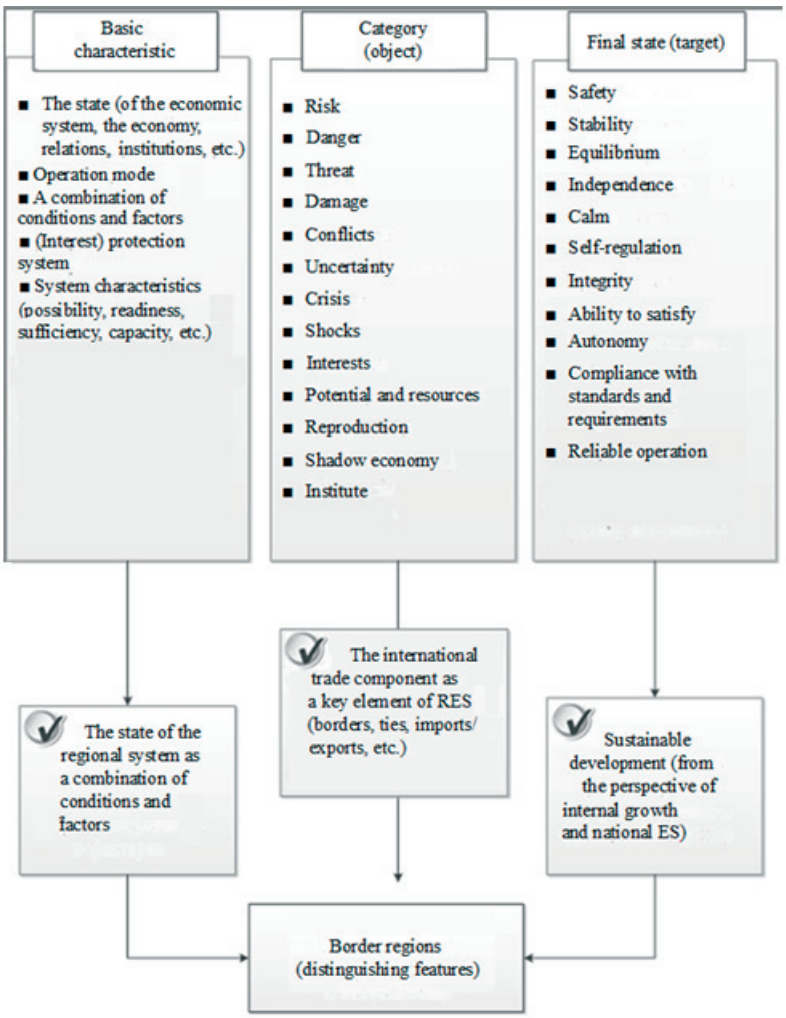


Fig. 1. The semantic content of the concept of 'economic security' in assessing and measuring border regions

Comment: ES is economic security, RES regional economic security.
Source: adapted from [1; 6; 40; 42].

At the same time, we are concerned with the fuzziness and generic character of the concept, whereas some publications do not add any clarity either to the classification or to the definition of the supplementary semantic content [40, p. 127]. Unfortunately, many works copy or borrow generously from other publications and studies, which largely complicates establishing exact authorship of the ideas proposed.

From the perspective of analysing the essence of the concept and the basic characteristics, the economic security of border regions should be considered, in our opinion, through examining or creating a combination of conditions and factors that ensure protection from external and internal threats and the achievement of desired goals. Therefore, the characteristics of border regions — their geography, economic structure, potential, resources, and others — account for the need to employ the philosophical and organisational approaches to studying economic security, which has been stressed by T. Yu. Serebryakova and N. Yu. Timofeeva [43, p. 239]. This equally applies to the 'economic security triad' of interests, stability, and independence, which was formulated by S.A. Afontsev [44, p. 16]. On the one hand, border regions are affected by negative external and internal impacts more strongly than their inland counterparts are. Here, 'safety' — the situation when 'external or internal threats to the preservation of a region's socioeconomic and financial strength are either absent or minimised' [6] — acquires crucial importance. On the other hand, in view of the considerable uncertainty and risks associated with a border region's environment, which may cause stability to suffer, achieving the state of safety is impossible without proactivity, adequate and timely reactions to challenges, and the creation of necessary conditions and factors. All this comprises the organisational approach to the problem of economic security.

In studying the category, or object, of economic security, it is important to consider international trade, since the geographic position of border regions makes them highly dependent on transboundary ties and the quality and condition of intergovernmental relations [45, p. 3]. As a result, border regions have a high capacity to integrate into the processes of the international division of labour and to gain competitive advantages by developing international cooperation and supporting various integrating forms of cooperation. In the structure of economic relations, international trade serves as one of the important sources of reproductive processes in a regional economy. However, under adverse conditions, external factors have a significant destructive effect on regional economies.

The border position of a region — a territory that is sometimes remote or isolated (for example, the Kaliningrad region) from Russia's major centres for industry, technology, resources, and production — lays down certain requirements to a balanced development from the perspectives of both internal growth and socioeconomic development and of national economic security. We consider equilibrium as the achievement of desired ratios and as a condition for economic reproduction. As a system-

ic characteristic of the rates and ratios of economic development, regional equilibrium can be ensured only through the interactions of local forms (based on production factors and stages of the production cycle [see, for instance, 46, p. 35]).

In the context of border regions, an analysis of the concept of 'economic security' helps to identify major criteria for assessing the applicability of the existing approaches to evaluating economic security. These criteria include:

1) consideration for types and specific features of regions. Regardless of the usual typology of regions, it is advisable to identify regional characteristics pertaining to the emergence and impacts of different classes of threats. This criterion is of critical importance for border regions;

2) indicators for evaluating different classes of threats, including those associated with international trade, from the perspective of the influence of transboundary ties and the quality and condition of intergovernmental relations on the financial and economic operations and regional performance;

3) an assessment of the (lack of) equilibrium and existing ratios in studying the economic security of different types of regions (particularly, border ones);

4) a developed research framework for analytical tools used to evaluate economic security: a procedure for compiling a list of indicators and their threshold values (economic and mathematical models, expert reviews, comparisons of statistical data, etc.), opportunities for assessing and forecasting the situation, comparisons with other regions;

5) the possibility of evaluating regional economic security in view of threat-producing catalyses for crises and the degree of a regional system's 'safety' and weaknesses (fig. 2).

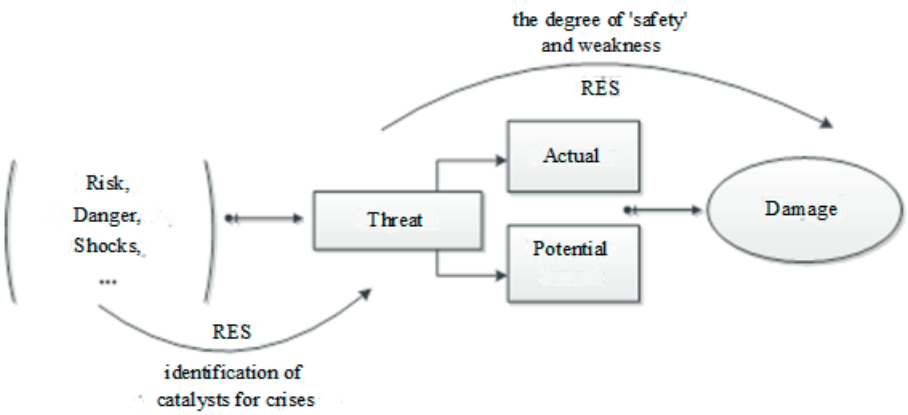


Fig. 2. The place of regional economic security (RES) in the change in an economic system's condition

Source: prepared based on [44].

In our study, 'weaknesses' stand for the condition of institutions, the quality of individual parameters and elements of a regional system, as well as factors and conditions precluding effective protection.

As a result, the existing and emerging actual and potential threats have a negative effect on, and adverse consequence for, a region. In particular, they result in deviations from equilibrium, disproportions, and skewed ratios. Overall, threats translate into the deterioration of a region's macroeconomic performance. All the approaches have similar limits as concerns the application of the techniques for assessing the economic security of border regions (table 1). Firstly, the procedure for selecting the indicators is not evident. Secondly, the sources for identifying the indicators' 'threshold' values are not clear. Thirdly, the universal nature of the techniques and approaches does not allow for the specific features of regions, in particular, border ones.

We believe that the disadvantages of the approaches to, and techniques for, evaluating the performance of border regions can be overcome by developing an algorithm for measuring economic security.

A methodology for evaluating and assessing a border region's economic security

An algorithm for assessing regional economic security has been addressed in the literature [10; 15; 47; 48 et al.]. Based on these findings, we propose to identify groups (classes) of threats to individual types of regions and to justify a system of general, specific, and special assessment indicators (fig. 3).

General indicators of the degree to which the major goals and objectives of protection and regional economic security are attained correspond to national interests. These indicators have the same form and content for any territory and object of assessment.

Specific indicators are those of the specific features of individual territories. These features are identified according to the groups (classes) of threats and problems in ensuring regional economic security. Special indicators are used to evaluate a region's safety in terms of food, transport, energy, financial, social, and other types of security.

The identification of the limits of the indicators' 'threshold' values requires a rationale that will use economico-mathematical simulations in combination with expert reviews. This combination is necessary for carrying out both quantitative and qualitative evaluations. Of crucial importance is the identification of the stage of indicator analysis and forecast. This makes it possible to assess the 'safety' of a regional economic system and its weaknesses based on deviations from 'threshold' indicators.

Table 1

Techniques and models for assessing and evaluating economic security

Approaches, techniques, models	Essence	Limits of application in the case of border regions
Macroeconomic techniques S. Yu. Glazyev [50]; E.A. Utkin and A.F. Denisov [51]; I.V. and N.I. Krasnikov [52]; E.D. Kormishkin [53]	The development of a system of RES indicators and identification of their threshold values and deviation, in particular, by using indices	The techniques do not take into account the specifics of regions of different types; it is not clear how the indicators are selected; sustainability parameters are not evaluated. The techniques satisfy applicability criteria 2 and 5
Expert review and rankings N.V. Dyuzhenkova [54]; S.P. Volkov [55]; N.P. Lyubushin, E.E. Kozlova, O.G. Cherkasova [56]	Ranking, scoring, expert reviews, in particular, by means of standardisation, normalisation, and the calculation of a composite index	The techniques and approaches cannot be applied to system sustainability parameters, assessment of catalysts for crisis, weakness, and 'safety'. The techniques satisfy applicability criteria 2 and 4
Economic-statistical techniques V.K. Senchagov [2; 4—6]; S.N. Mityakov [2; 4; 15; 16]; I. V. Dolmatov [57]; O.S. Filetkin [58]; S.N. Yashin, E.N. Puzov [59]; I.V. Nikiforova [60]	A multivariate statistical analysis, correlation and regression analysis, index technique, ANOVA	The techniques do not take into account the specifics of regions of different types. Approaches to the identification of 'threshold' values are lacking. The assessment of weakness and 'safety' is complicated. The techniques satisfy applicability criteria 2, 4, 5
Econometric (economic mathematics) V.V. Karpov and K.K. Loginov [17]; Lapaev D.N. [15; 47]; E.S. Mityakov [16; 47]; Lagzdin A. Yu. [61]; V.V. Karpov, A.A. Korableva [1; 14; 17]	ARIMA, ARMA, differential calculus, Fourier analysis, adaptive filtering, fractal analysis, etc.	The technique is complicated in terms of cross-regional measurements and comparative analysis (within one type). The possibilities for a follow-up monitoring are not clear. The techniques satisfy applicability criteria 2, 4 and 5

Game-theoretical techniques and operational research V. V. Ivchenko, T. M. Shulkina, M. V. Bilchak [62]; O. V. Komelina, N. A. Fursova[63]; S. G. Svetunkov and T. S. Klebanova [64]; V. V. Nikitin [65]	Network and analytical simulations, CGE models, elements of the complex variable theory	The techniques are applicable to measurements at the level of a single region. The results of evaluating the impact and consequences of threats are satisfactory but require a large number of calculations. The techniques satisfy applicability criteria 1, 2, 3
Neural network and fuzzy set techniques and models O. V. Latuta [48]; A. F. Rogachev [66]; V. V. Borisov, V. V. Kruglov, A. S. Fedulov [67]; A. I. Galushkin [68]	Neural network models for assessing a region's fragility and relevant threats using the mathematical tools of fuzzy logic	The application is limited to the identification and/or forecasting of the proximity of crises (catastrophes). The approach has to be further developed to cater to a wider range of problems. The techniques satisfy applicability criteria 2, 4
Balance method O. N. Chuvilova and I. V. Romanyuta [69]; E. S. Yankovskaya [70]	Geo-economic (geo-financial) balance, economic system imbalances as a threat to RES. An assessment of individual RES parameters: food, energy, financial, and other types of security	The я satisfy applicability criteria 2, 3, 5
Integrated approach V. K. Senchagov [6]; A. I. Tatarkin [9]; D. V. Tretyakov [41]; D. A. Kuznetsov and M. N. Rudenko [71]; T. Yu. Feonfilova [72]; T. D. Romashchenko [21**Ошибка! Источник ссылки не найден.**]	A combination of the above techniques and approaches at different stages of aggregation	The techniques are universal, which precludes the identification of the essence and features of ES evaluation in the case of border regions. The techniques satisfy applicability criteria 2, 4, and 5

Comments: 1 — region type, 2 — threat class (according to their sources and/or types), 3 — system stability parameters (balance, ratios, equilibrium), 4 — a developed research framework, 5 — an assessment of catalysts for crises, weaknesses, and 'safety'.

Source: prepared based on [40; 41].

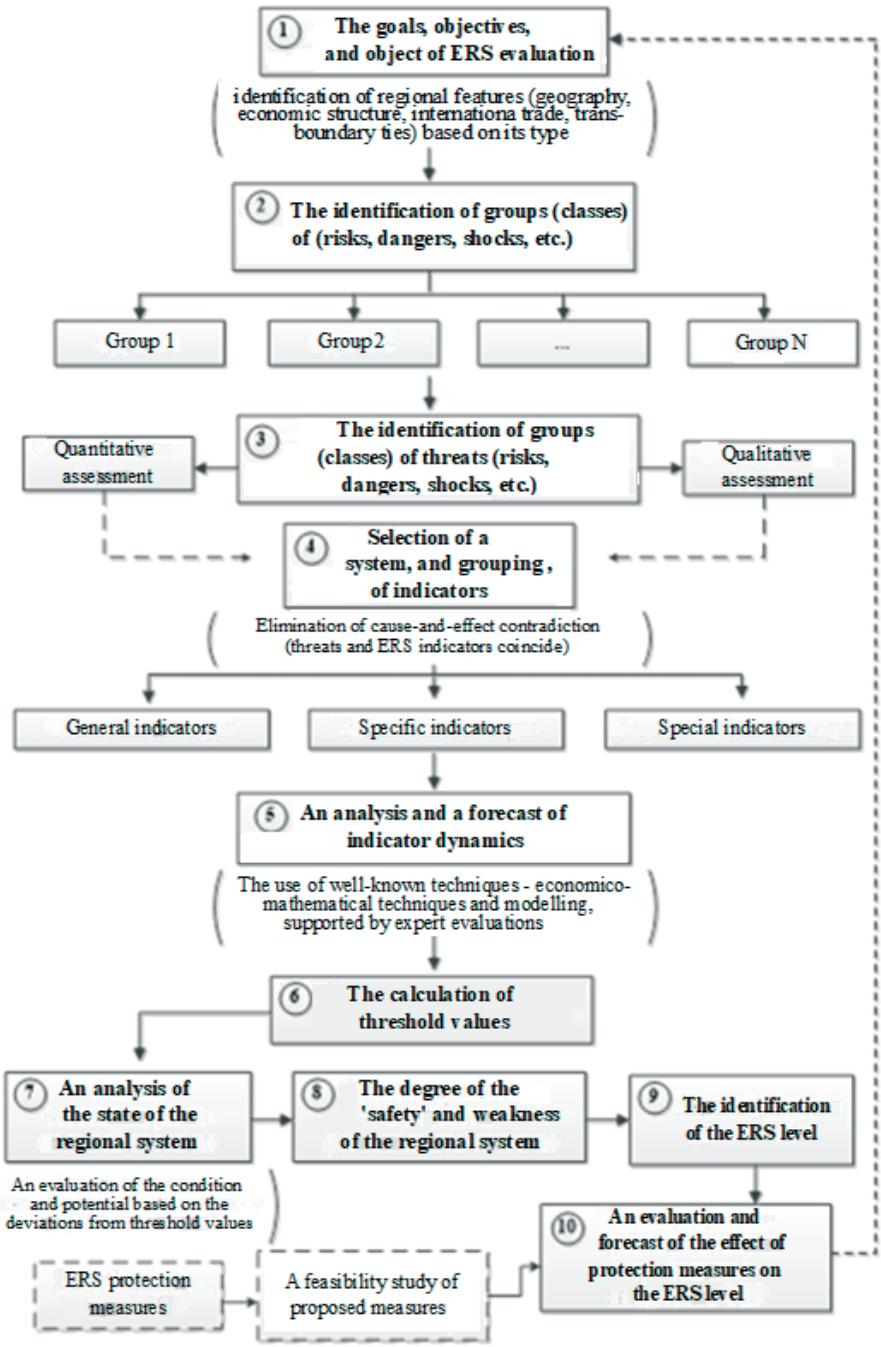


Fig. 3. An algorithm for regional economic security assessment taking into account the border region typology

Source: prepared by the authors.

If relevant data and the results of economico-mathematical simulations of a regional system's development are available, it is advisable to assess and forecast the impact of the existing and proposed 'protection' measures on the level of economic security. The last step of the algorithm is of special importance. However, such assessments are not carried out. The problem of ensuring regional economic security in view of the efficiency of the measures taken and their effect on the achievement of targets remain unsolved. Moreover, a relevant methodological framework is lacking.To illustrate the above conclusions we propose to consider the application of economico-mathematical simulations to evaluating the effect of different factors and conditions on regional economic security and assessing the efficiency of 'protection' measures. The analysis employs economico-mathematical techniques based on our earlier developed sectoral models [3; 49], as applied to a regional milk and dairy market. There were several reasons to select such an object. Firstly, it is the availability of representative data on milk and dairy products, which were obtained through sampling value added chains in the Kaliningrad region's agricultural industry. Secondly, the problem of milk and dairy supply deserves special attention from the perspective of food security. Thirdly, milk and dairy value chains [3] were thoroughly studied, which was made possible by the availability of full and relevant information on the coordination of actors in the production chains of the regional agricultural industry.

The reference conditions for assessments and simulations are presented below.

We started from the changes in the regional economic environment that took place in 2014—2016 amid the deterioration of the geopolitical situation, the sanctions imposed by the EU and the US against Russia, and Russia's countersanctions.

1. Industry: milk and dairy products.

2. Threats and risks: currency basket volatility; a reduction in the imports of raw materials and components; changes in the sales geography.

3. Target: an assessment of the efficiency of the measures for regulating the level of regional production localisation, from the perspective of economic security (in the case of the agricultural industry). Reference year: 2014.

4. Measure subject to regulation: the proportion of imported components. There are three variants for the calculation of the proportion of imported components. Variant (1) is assumed at the level of the reference year, (2) is reduced by 50 % as compared with the reference year; (3) is reduced by 0 %.

5. All the variants allow for exchange rate volatility as compared with the reference year. According to the Central Bank of the Russian Federation, the average nominal euro to rouble exchange rate was 50.46 roubles in 2014, 67.43 roubles in 2015, and 74.06 roubles in 2016.[1]

[1] The Central Bank of the Russian Federation. URL: https://www.cbr.ru/statistics (accessed 07.12.2017).

Table 2 and figures 4 and 5 show selected results of the testing of the model for the milk and dairy market.

Table 2

A comparative analysis of regulatory measures in the agricultural industry of the Kaliningrad region from the perspective of economic security

Measure	Simulation output		
	Variant 1	Variant 2	Variant 3
1. A reduction in the value added along the chain caused by currency exchange rate violations, %			
value added at the optimal price and demand levels	–10.29	–9.37	–8.54
valued added at scenario (actual) price and demand values	–12.84	–10.63	–8.65
2. The ratio between the scenario (actual) and optimal value added, %			
without currency rate volatility	81.12	81.42	81.82
after changes in the currency rate	78.82	80.29	81.82
3. An increase in the value added upon a reduction in the proportion of imported components, as compared with the reference year, %			
without changes in the currency rate	100.00	100.63	101.70
agriculture companies	100.00	100.80	102.15
processing companies	100.00	100.66	101.76
after a change in the currency rate	100.00	103.18	106.59
agriculture companies	100.00	104.04	108.37
processing companies	100.00	103.33	106.91

Source: calculated using the authors' methodology.

A reduction in the imports at the level of agriculture companies (table 2) leads to a smaller decrease in the value added along the chain in comparison with the reference year (–10.29% according to variant 1, –8.54% according to variant 2). At the same time, an increase in localisation against a reduction in the value added, following a change in the currency rate (variant 1), translated in a subsequent growth in value added by 6.59% (variant 3).

All the variants show an increase in the value added in comparison with the guaranteed value added. This is explained by that the actual market prices grew more rapidly than the cost of purchasing resources from external suppliers.

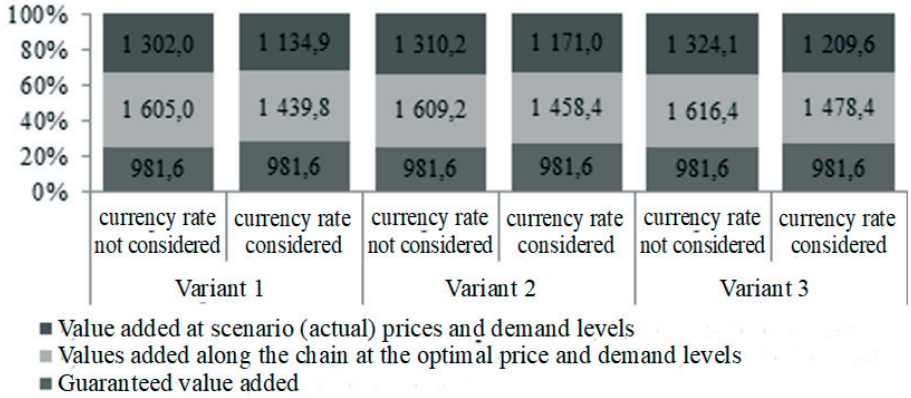
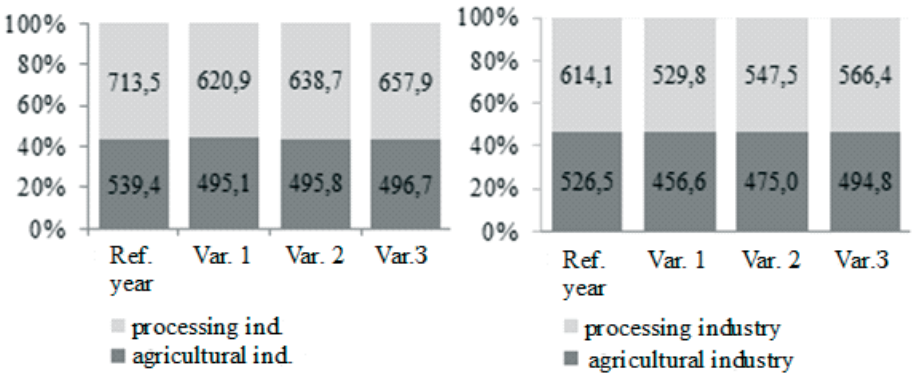


Fig. 4. Changes in the value added along the chain, in comparable prices (the case of milk and dairy products), million roubles

Source: calculated based on the authors' methodology[2].



a) Value added along the chain at an optimal price and demand level

b) Value added at the scenario (actual) price and demand level

Fig. 5. Value added along the chain, in comparable prices (the case of milk and dairy products), million roubles

Source: calculated based on the author's methodology.

[2] Guaranteed value added is the value added obtained by regional agricultural and processing industry companies in the previous (reference) period.

However, as the currency rate changes, the measures to increase the production localisation cannot make up for a reduction in the value added. Within variant 3, the scenario (actual) cost reaches 1 209.64 million roubles, whereas, at a stable exchange rate and proportion of imports, it would be at 1 301.98 million roubles. Complete discontinuation of imports (fig. 5) translates into a reduction of the value added — 566.4 million roubles as against 614.09 million roubles in the reference year.

Overall, calculations suggest that a reduction in the costs borne by agriculture companies and an increase the value added occur as production localisation grows. Changes in the currency rate have a negative impact on value added (a reduction by 8—12 %). In the case of the economic security of the Kaliningrad region, it is clear that even a full transition to Russian components does not ensure the optimal level of the value added, either before or after the change in the currency rate (a reduction within 18 %).

All the above stresses the need for the employment of additional tools. Firstly, it is a reduction in imports at the level of processing companies. Secondly, it is cooperation and networking at the level of the chain. Thirdly, it is the introduction of special measures, different from production localisation.

The above simulation emphasises the need to take into account regional specifics when evaluating economic security, as well as the importance of employing economico-mathematical calculations at different steps of the assessment algorithm.

Conclusions

This study addressed the most acute methodological problems of applying the existing techniques and models for economic security evaluation to border regions. These are the definition of the content of a border region's economic security and the identification of relevant conditions and factors, and significant principles and criteria. Overall, these issues comprise a framework for the further development of a methodology for a border region's economic security.

Based on the existing theoretical and practical works on regional economic security, and our own study into the theory and practice of evaluating Russia's regional economic security, we developed recommendations for improving the algorithm for assessing and evaluating economic security in the case of border regions.

The following requirements turn out to be of crucial importance: 1) the consideration of the types and specifics of regions; 2) the evaluation of different classes of threats, including those relating to international trade;

3) an assessment of the equilibrium and relevant ratios; 4) a developed research framework; 5) the identification of catalysts for crises resulting in threats and the assessment of a regional system's 'safety' and weaknesses.

An overview of the theoretical and methodological issues relating to assessing and evaluating economic security in the case of border regions requires the identification of most urgent problems. Our study can serve as the basis for theoretical and practical recommendations for developing an integrated approach to evaluating border regions' economic security. We believe the following theoretical and methodological tools to be the most significant.

1. The formulation of a more precise definition of the concept and structure of the functional components of a border region's 'economic security' in view of the synthesis of the relevant theoretical foundations. For instance, it is important to consider the systemic, situational, process, resource (investment), cluster, and cyclic approaches [18, p. 242—243].

2. A classification and a typology of economic security indicators in view of regional specifics. The identification of essential elements of border regions' economic security. These elements are subject to assessment and evaluation. The requirement of result comparability and sufficiency for ensuring the economic security of border regions amid geopolitical turbulence.

3. An assessment of the applicability of different models, techniques, and tools to assessing and evaluating a border region's economic security. The development of a methodological framework for, and an integrated approach to, assessing and evaluating the economic security of border regions. Techniques and models are tested in the cases of Saint Petersburg, Sevastopol, the Leningrad, Kaliningrad, Smolensk, and Rostov regions, and the Republic of Crimea.

4. The construction of a conceptual model of regional economic security in order to assess the impact of changes in geopolitical, geo-economic, geo-ecological, and other factors on a region's economic security.

5. The testing of the conceptual economic security model in the cases of Russia's western borderlands (Saint Petersburg Sevastopol, Leningrad, Kaliningrad, Smolensk, Rostov, Murmansk, Pskov, Bryansk, Kursk, and Voronezh regions, and the Republics of Crimea and Karelia).

We believe that a major impediment to the study was the large number of quantitative and qualitative parameters that lack representative databases and official statistics. Moreover, there is a need to develop a package of economico-mathematical models that require identification and adjustment to individual regional economic systems. Special attention should be paid to expanding the use of economico-mathematical

techniques and models, particularly, in assessing the influence of various factors and administrative and regulatory measures on changes in the economic security parameters.

In view of the urgency of the above problems, our findings and recommendations will be used in developing and testing a conceptual economic security model for the regions of Russia's western borderlands.

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